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The President's Column

Morris H. Hansen



This year was the third of a three-year special grant which the Association received from the Carnegie Corporation in 1957. The amount of \$9,000 was given for travel grants to international statistical meetings. Any member of ASA in the United States, Canada and Mexico could apply. In order to make the funds stretch among as many members as possible, each individual grant was limited to the round-trip tourist air fare from New York or San Francisco (as the case may be) to the site of the conference. Upon receipt of the grant from the Carnegie Corporation, the entire amount was placed in savings accounts to obtain interest income. This added a total of approximately \$600 to the travel grant fund.

A committee of four was appointed to review the applications received. I would like to pay tribute at this time to the members of the committee who carried out a difficult task so well. With the granting of the final application approved this year and submission of their report to the Board and Council, the committee was dissolved with thanks. Those serving were: George Garvy, Dorothy M. Gilford, A. J. Jaffe and Harry Venneman, Secretary.

The international meetings which were announced as being within the scope of the program is indicative of the range of interest of the members of ASA: International Statistical Institute (Brussels), International Meeting of the Institute of Management Sciences (Paris), International Congress of the European Organization for Quality Control (Brussels), International Pharmacology Symposium (Leyden), International Conference on Operational Research (Aix-en-Provence), Regional Conference of the International Association for Research in Income and Wealth (Addis Ababa), International Population Conference (Vienna), and International Statistical Institute (Tokyo).

Although offered under the program, not every meeting listed had a grantee attending. A total of thirteen grants were made during the three-year period of the program. The Committee has recommended and the Board and Council concurred that the Association request a renewal of the grant from the Carnegie Corporation of New York. This has been done, but as yet no decision has been received by ASA. However, whether

(Continued on Outside Back Cover)

NEWS

1961 CIVIL SERVICE EXAMINATIONS OPEN — AAAS MEETING IN NEW YORK — ECONOMIC MEETINGS IN ST. LOUIS — NEW FELLOWSHIPS AND GRANTS ANNOUNCED — FSUC WASHINGTON MEETING — REPORT ON TRANSPORTATION CONFERENCE



President Morris H. Hansen delivering his Presidential Address at the ASA Annual Meeting at Stanford University last August. Seated to his left is President-Elect Martin R. Gainsbrugh, who will take office on January 1, 1961.

1961 Federal Service Entrance Examination

Applications for the 1961 Federal Service Entrance Examination are now being accepted by the Civil Service Commission. This examination is designed primarily as an avenue through which young people of promise, including statisticians and economists, may enter the Federal service upon completion of their college education. Persons who qualify are considered for trainee positions in some 60 different occupational fields. These positions are in various Federal agencies located in Washington, D. C., and throughout the United States. There may also be a few openings in foreign countries.

The examination is open to college juniors, seniors, and graduates, regardless of major study, and to persons who have had equivalent experience in administrative, professional, technical or other responsible work. Starting salaries will be either \$4,345 or \$5,355 a year depending on the qualifications of the candidate. Many liberal "fringe benefits" are included. In addition, a limited number of management Internships with starting salaries of \$5,355 and \$6,435 a year will be filled from this examination. These positions are offered to people with management potential for special training for periods ranging from a few months to 18 months after the appointment.

Written tests are scheduled for January 14, February 11, April 15 and May 13, 1961, and will be given in many cities throughout the country. Applications for the January 14 test must be filed by December 22, 1960. Other closing dates for applications are January 26, March 30, and April 27, 1961. Applications for management Internships will not be accepted after January 26, 1961.

Further information about the tests and how to apply are given in Civil Service Announcement No. 240. These announcements and application forms may be obtained from college placement officers, many post offices throughout the country, civil service regional offices, or from the U. S. Civil Service Commission, Washington 25, D. C.

AAAS Annual Meeting

The American Association for the Advancement of Science is holding its annual meeting in New York City, December 26-31, 1960. The meeting is expected to be one of the largest in recent years. The American Statistical Association and Section K of the AAAS (Social and Economic Sciences) are co-sponsoring two sessions.

The first of these sessions, arranged by the Biometrics Section of the New York Chapter of ASA, is concerned with hospital statistics in community planning. The speakers are J. Douglas Colman, President, Associated Hospital Service of New York, who will discuss "The Opportunities of Operation"; Paul Sheatsley, National Opinion Research Center, University of Chicago, who will talk on "The Massachusetts Hospital Study—Collecting Data through Survey Research"; Monroe Lerner, Health Information Foundation, whose subject is "Hospital Use in Indiana and in Saskatchewan by Diagnosis—Use of Existing Hospital Data"; and Marta Frankel, M.D., New York City Department of Hospitals, who will discuss "Hospital Data in Community Planning for the Aged." Dr. Paul M. Densen, Deputy Commissioner of Health, New York City, will preside.

The subject of the second session is statistical problems in social insurance research. The program for this session is not yet complete, but will include papers by Abraham J. Berman, New York State Department of Labor, on "Some Statistical Problems in Workmen's Compensation," and by Harry Malisoff, Brooklyn College, on "Some Invariant Characteristics of Unemployment Insurance Beneficiary Experience."

A number of sessions of general interest have been arranged. One of these is a session on Tuesday evening, December 27, on "The Challenge to Science of World Conditions Today," at which Sir Charles P. Snow, Visiting Professor of English at the University of California, is the speaker and Rev. Theodore M. Hesburgh, President of the University of Notre Dame, and William O. Baker, Vice President—Research, Bell Telephone Laboratories, are discussants. Others are a four-session symposium on "The Sciences in Communist China," an interdisciplinary symposium in the social sciences—"The Urban Frontier: A Conquest of Inner Space," and a symposium on "Psychological and Sociological Implications of Nuclear Arms."

Other sessions which may be of particular interest to statisticians are those sponsored by Section A of the AAAS (Mathematics), including one on Tuesday evening,

December 27, at which Professor Frederick Mosteller, Chairman of the Department of Statistics, Harvard University, is presenting a paper on "Probability and Statistics." The American Mathematical Society, the Association for Computing Machinery, and the Society for Industrial and Applied Mathematics are co-sponsoring several of these sessions.

The Commodore and the Biltmore will be co-headquarters hotels for the AAAS as a whole. Three other hotels in the vicinity of Grand Central Station will be the headquarters of related sections and societies, the Roosevelt being headquarters for Section K and the ASA. Special rates have been arranged at these hotels. Further information may be obtained from Raymond L. Taylor, Associate Administrative Secretary, American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington 5, D.C.

Economic Meetings at St. Louis

The American Economic Association is holding its 73rd Annual Meeting at the Chase-Park Plaza Hotel, December 28-30, 1960. The sessions this year are organized around the broad theme "Frontiers of Economic Knowledge." Several other societies are also meeting in St. Louis during the Christmas week, including the Econometric Society, the American Marketing Association, the American Finance Association, the American Farm Economic Association, the Industrial Relations Research Association, and the Regional Science Association.

In recent years, an attempt has been made to hold the American Statistical Association Annual Meeting in the same city and at the same time as that of the AEA and related societies every third year, and with other associations in the intervening years. In December 1961, the ASA will be meeting with the American Economic Association and related societies, as well as with the Biometrics Society (ENAR) and the Institute of Mathematical Statistics, in New York City. The 1960 ASA meeting was held at Stanford University, California, August 23-26.

NSF Fellowships for 1961-62

The National Science Foundation plans to award approximately 1,200 graduate and 150 postdoctoral fellowships during the 1961-1962 academic year. The National Academy of Sciences-National Research Council will again advise the National Science Foundation in making these awards and is appointing panels of outstanding scientists to evaluate applications of all candidates. Final selection will be made by the National Science Foundation.

These fellowships may be applied to advanced study in the mathematical, physical, medical, biological, and engineering sciences, including anthropology, psychology (excluding clinical psychology), and the following social sciences: geography, mathematical economics, econometrics, demography, information and communication theory, experimental and quantitative sociology and the history and philosophy of science. They are open to college seniors, graduate and postdoctoral students, and

others with equivalent training and experience who are citizens of the United States.

All applicants for graduate (predoctoral) awards will be required to take the Graduate Record Examination designed to test scientific aptitude and achievement. This examination, administered by the Educational Testing Service, will be given on January 21, 1961, at designated centers throughout the United States and certain foreign countries.

The annual stipends for graduate Fellows are as follows: \$1,800 for the first year; \$2,000 for the intermediate year; and \$2,200 for the terminal year. The annual stipend for postdoctoral Fellows is \$4,500. Additional allowances are made for dependents. Limited allowances will also be provided to apply toward tuition, laboratory fees, and travel.

Further information and application materials may be obtained from the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, N. W., Washington 25, D. C. The deadline for the receipt of applications for regular postdoctoral fellowships is December 19, 1960, and for graduate fellowships, January 6, 1961.

NAS-NRC Postdoctoral Research Associateships and Fellowships

The National Academy of Sciences-National Research Council is offering a program of Postdoctoral Resident Research Associateships supported by several agencies of the Federal Government. Through these associateships, tenable at certain government laboratories and research centers, young investigators of promise are provided an exceptional opportunity to receive advanced training in well-equipped laboratories among highly qualified scientists dealing with various fields of fundamental and applied research.

Participating laboratories are the National Bureau of Standards (Boulder, Colorado, and Washington, D.C.); Naval Ordnance Laboratory (White Oak, Silver Spring, Maryland); Naval Research Laboratory (Washington, D. C.); Naval Weapons Laboratory (Dahlgren, Virginia); Navy Electronics Laboratory (San Diego, California); U. S. Army Chemical Corps Biological Laboratories (Fort Detrick, Frederick, Maryland); several laboratories of the Agricultural Research Service, and four technical centers of the Air Research and Development Command.

Applicants will be required to produce evidence of training equivalent to that represented by the Ph. D. or Sc. D. degree and to demonstrate superior ability for creative research. The stipend for most of these programs will be \$8,955, subject to income tax.

Research opportunities at the regular and senior postdoctoral levels are also available at the Goddard Space Flight Center of the National Aeronautics and Space Administration (near Washington, D. C.) and at the Quartermaster Research and Engineering Center Laboratories (Natick, Massachusetts) and the Quartermaster Food

and Container Institute (Chicago, Illinois). Stipends are appropriate to the level.

A new Postdoctoral Research Fellowship program has been inaugurated this year—supported by the Air Force Office of Scientific Research of the Air Force Research Division. Awards will be made in the various branches of the natural and applied sciences to United States citizens at the postdoctoral level for pursuance at educational institutions and research laboratories in the United States and abroad. The stipend for this appointment is at the rate of \$6,000 annually with dependency allowances.

Further information and applications are available from the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C. Applications for Research Associateships must be filed on or before February 1; for Research Fellowships no later than January 9, 1961.

Training Grants at U. of Chicago

The Department of Statistics of the University of Chicago has been awarded a grant by the National Institutes of Health to encourage training in the application of statistics to problems in the fields of public health and the biological and behavioral sciences. The Department can thus offer stipends to students with interest in these areas.

The stipends range up to \$2,300 plus tuition for graduate students and up to \$5,000 plus tuition for postdoctoral students.

These students will ordinarily pursue the same general program of study as other students in statistics, participate in the biostatistical consulting and teaching activities of the Department, and attend some courses in the biological sciences.

Requests for further information and application forms should be addressed to Mr. Paul Meier, Department of Statistics, University of Chicago, Chicago 37, Illinois.

Fourth Annual Meeting Federal Statistics Users' Conference

The Fourth Annual Meeting of the Federal Statistics Users' Conference was held at the Statler-Hilton Hotel in Washington on September 29-30. More than 160 non-governmental users and guests from Federal statistics-producing agencies participated in the various sessions.

Walter Hoadley, Vice President and Treasurer of the Armstrong Cork Company, principal speaker at the September 29 luncheon session, stressed the need to put priorities on demands for improvements in Federal statistics as a basic requirement for future progress. Noting especially the need for better information relating to distribution and the service industries, for more regional and localized data, and for more detailed information by industry, Mr. Hoadley cautioned users not to expect to get all the information they need from the Federal Government at the taxpayers' expense and urged them to assess their needs realistically, set priorities, and give first priority to public policy needs for information.

Philip Hauser, Professor of Sociology and Head of the Department of Sociology at the University of Chicago, addressing the September 30 luncheon session, called for a re-examination of the organization structure of Federal statistical agencies. Professor Hauser argued that Federal statistics programs have grown haphazardly and that the centralized coordination of programs through the Office of Statistical Standards, while a notable step forward, needs to be reviewed in the light of modern conditions. He suggested that a more centralized structure might yield a greater return of information per unit of resources employed.

Discussions at round-table sessions covered: (1) Modern Statistics for a Changing Agriculture (Roy A. Battles, The National Grange, Chairman); (2) Manpower Statistics for the '60's (Lazare Teper, International Ladies' Garment Workers' Union, Chairman); (3) What Next in Consumer Intentions Surveys? (Frederick N. Sass, The Pennsylvania Railroad Company, Chairman); (4) Foreign Market Statistics: Untapped Resources (William B. Dale, Stanford Research Institute, Chairman); (5) The Economic Censuses: New Prospects, New Problems (Gordon A. Hughes, Scott Paper Company, Chairman); and (6) New Frontiers in Health, Education, and Social Security Statistics (Herbert Stein, Committee for Economic Development, Chairman).

New trustees were elected at the meeting to represent business, farm, labor, and nonprofit organizations. Newly elected trustees are: business group—Robert J. Eggert, Ford Motor Company (re-elected) and Frederick N. Sass, The Pennsylvania Railroad Company; farm group—W. E. Hamilton, American Farm Bureau Federation, Angus McDonald, National Farmers Union, and Robert E. Sanders, North Dakota Farmers Union; labor group—Peter Henle, AFL-CIO (re-elected), Charles Donahue, United Association of Plumbers and Pipe Fitters (re-elected), and Sylvia Gottlieb, Communications Workers of America; and from the nonprofit organizations—Howard L. Stier, American Marketing Association (re-elected) and Robert N. Grosse, The RAND Corporation.

The new officers for the coming year are: Robert J. Eggert, Chairman, and Angus McDonald, Peter Henle, and Howard L. Stier, Vice Chairmen.

A Conference on Federal Distribution Statistics was held at the Statler-Hilton Hotel on September 28. Three workshop sessions met concurrently to consider the problems of using existing Federal statistics and the need for their improvement. *Workshop I*—Statistics Relating to Retail Sales, Inventories, Organization and Structure, was chaired by Warren N. Cordell, A. C. Nielsen & Company; *Workshop II*—Statistics Relating to Wholesale Sales, Inventories, Organization and Structure, was headed by Raymond M. Stearns, McKesson & Robbins, Inc.; and *Workshop III*—Other Statistics Relating to Distribution Needed for Economic Analysis, was guided by Robert J. Eggert, Ford Motor Company. Recommendations arising out of the Conference will be incorporated in FSUC's long-range program for the improvement of Federal statistics which is now being considered in draft by Conference members.

The long-range program, being considered by Conference members, covers most of the major areas of Federal statistics. It has been prepared by a committee headed by Gerhard Colm, National Planning Association. It seeks to provide a flexible framework for evaluating proposals for statistical improvements in terms of common user needs and is the result of nine months of intensive committee work. In preparing its draft report, the Committee considered some 250 specific needs for improvement in Federal statistics suggested by FSUC members, by producers of Federal statistical data, and by individuals who have used Federal statistics in developing studies or policy recommendations on public issues of vital importance.

Report of NAS Conference on Transportation Research

The National Academy of Sciences-National Research Council has recently published the report of the Conference on Transportation Research, a study group convened by the National Academy of Sciences. This study group, composed of about 150 participants from Government, industries, universities and research institutions, met at Woods Hole, Massachusetts, August 1 to September 3, 1960 to review the nature and ramifications of transportation in the United States and to formulate a basis for attacking transport problems through the stimulation of research and greater understanding. Financial support for the Conference was provided by the Rockefeller Foundation, the National Science Foundation and the Office of Civil and Defense Mobilization. The General Chairman was Professor Harmer Davis, Director of the Institute of Transportation and Traffic Engineering, University of California.

The Conference formed a special panel to consider problems of data needs in transportation. Professor Harold Wein of Michigan State University served as Panel Chairman. Other participants included Dr. Donald Church, Bureau of the Census; Professor Clifford Clark, New York University; Professor Virgil Cover, Syracuse University; Dr. Victor Lewinson, National Academy of Sciences-National Research Council; Edward Margolin, Interstate Commerce Commission; John C. Winter, Department of Agriculture; Boyd Ladd, Johns Hopkins University; Professor John C. Kohl, University of Michigan; Professor Kent Healy, Yale University; and E. D. Spoonamore, Military Traffic Management Agency. The work of this panel formed the basis for Chapter V of the Report. In this chapter, our present information on transportation is critically evaluated and a number of gaps are noted.

Two other reports containing papers and discussions of the Conference are scheduled for publication by the

National Academy of Sciences-National Research Council. They are "Transportation Design Considerations" (Publication 841), and "U. S. Transportation: Resources, Performance, and Problems" (Publication 841S).

Requests for copies of the report of the Conference on Transportation Research (Publication 840), should be directed to National Academy of Sciences-National Research Council, Washington 25, D. C.

Statistical Laboratory Established at Arizona State

A statistical laboratory has been established in the physical sciences center of Arizona State University, Tempe, Arizona. The laboratory will provide university-wide services to assist members of the faculty and graduate students with research projects involving statistical techniques. It will also assist in preparing data for processing by the ASU computing center.

Dr. John E. Freund, Chairman of the Department of Mathematics, and Dr. Irwin Miller, Associate Professor of Mathematics, are co-directors of the laboratory.

Expansion of C.U. Statistical Laboratory

The Statistical Laboratory of The Catholic University of America is expanding its activities into the areas of biostatistics and biometry. A training program and a consulting service are being organized. Professor Edward Batschelet (on leave from the University of Basel, Switzerland) was appointed Visiting Professor in this program for the academic year 1960-61. Professor Harold Bergstrom of the Institute of Applied Mathematics of Chalmers Institute of Technology (Göteborg, Sweden) was appointed Visiting Professor for the academic year 1960-61. He will be primarily engaged in research in probability theory. Professor D. Dugué of the Sorbonne (Paris, France) and Dozent T. E. Dalenius of Stockholm University are expected to visit Catholic University during the spring term 1961.

Illinois Short Course in Quality Control

The fourteenth annual basic short course in Quality Control by Statistical Methods will be presented by the Division of University Extension of the University of Illinois in Urbana from January 30 through February 9, 1961. Intensive work will be given in the fields of control charts, acceptance sampling, and related topics. The course is designed for those in the areas of design, production, procurement, management, quality control, and inspection.

For further information, write to Professor John A. Henry, Mechanical Engineering Laboratory, University of Illinois, Urbana, Illinois.

International STATISTICAL ACTIVITIES

1961 ISI MEETING

The 33rd Session of the International Statistical Institute will be held in Paris from August 29 through September 6, 1961. The provisional program is shown below.

I. INVITED PAPERS MEETINGS

<i>Organizers of meetings</i>	
<i>Economic and social sciences</i>	
Production, income and financial flows in national accounts	G. M. W. Fürst (Germany)
Food availability and nutrition statistics	P. V. Sukhatme (India)
Statistical aspects of urban sociological research	D. V. Glass (United Kingdom)
Traffic congestion	H. Guth (Switzerland)
<i>Biology</i>	
Statistics and health problems	J. Berkson (U.S.A.)
<i>Expository papers meeting</i>	
Present status of statistics in the sciences (plenary meeting)	Chairman of Program Committee
<i>Physical sciences</i>	
Time series analysis	J. Durbin (United Kingdom)

Life testing and reliability J. Blanco Loizelier (Spain)

Statistical methodologies

Model building (plenary meeting) Chairman of Program Committee

Data Processing

Data processing M. H. Hansen (U.S.A.)

Statistical Training

Applied statistics training in industry in European countries A. Vessereau (France)

II. CONTRIBUTED PAPERS MEETINGS

A. Proposed subjects for free papers

Business tests

Statistical analysis of risk and tariff of accident assurance

Multivariate and discriminatory analysis to problems in biology

Recent results obtained in mathematical statistics.

B. Meetings reserved for further contributed papers

AUSTRALIA

A symposium on "Statistics in Industrial Management", sponsored by the Statistical Society of New South Wales, was held in May, 1960. Fourteen papers on a

Visiting Scholars

A list appears below of visiting scholars whose work is in probability and statistics or in related fields. A supplementary list will appear in the February 1961 issue of THE AMERICAN STATISTICIAN. The editor will be happy to receive information concerning present or future visitors to the United States and Canada.

VISITING SCHOLARS IN THE UNITED STATES AND CANADA

Name	Home Country	Host Institution	Period of visit
BATSCHULET, E.	Switzerland	Catholic University	Sep. 60-June 61
BERGSTROM, H.	Sweden	Catholic University	Sep. 60-Sep. 61
BHATTACHARYA, P. R.	India	Univ. of No. Carolina	Sep. 60-June 61
CHAKRAVARTI, I. M.	India	Case Inst. of Technology	Sep. 60-Sep. 61
DALENIUS, T.	Sweden	Catholic University	Feb. 61-May 61
DRAPER, N.	United Kingdom	Univ. of Wisconsin	July 60-July 61
DUGUE, Daniel	France	Catholic University	Feb. 61-May 61
EICKER, F.	Germany	Univ. of No. Carolina	Sep. 60-June 61
ELFVING, Erik Gustav	Finland	Stanford University	Aug. 60-Feb. 61
FISZ, Marek	Poland	Univ. of Washington	Sep. 60-June 61
ITO, Kiyosi	Japan	Mass. Inst. of Technology	July 60-Nov. 60
JOHNSON, N. L.	United Kingdom	Case Inst. of Technology	Sep. 60-Sep. 61
MORRISON, S. L.	United Kingdom	Univ. of No. Carolina	1960-61
RAY-CHAUDHURI, D. K.	India	Univ. of No. Carolina	Sep. 60-June 61
RANGASWAMI AIYAR, Krishna	India	Univ. of No. Carolina	Sep. 60-Jan. 61
SAMPFORD, Michael R.	United Kingdom	No. Carolina State Coll.	Jan. 61-June 61
SCHUTZENBERGER, Marcel	France	Univ. of No. Carolina	Sep. 60-June 61
STONE, Mervyn	United Kingdom	Princeton University	Sep. 60-June 61
TANAKA, Hiroshi	Japan	Mass. Inst. of Technology	Sep. 60-Aug. 61
VAN EEDEN, Constance	Netherlands	Michigan State Univ.	Sep. 60-Aug. 61
WATTERSON, Geoffrey A.	Australia	Virginia Polytech. Inst.	Aug. 60-Aug. 61

variety of topics were presented. The complete program is given in *The Australian Journal of Statistics*, Vol. 2, No. 2, August 1960, page 92.

BRAZIL

At the General Assembly of the **Sociedade Brasileira de Estatística**, on July 29, 1960, the following members of the society were elected to the board of directors for the biennium 1960-62: President, Hildebrando Martins da Silva; Vice Presidents, Sylvio de Miranda Ribeiro, Virgílio da Fonseca Gualberto; Secretary General, Maurício Simões Gonçalves; Associate Secretaries, Rubinete Pereira da Silva, Paulo Barreto Marim; Treasurers, Sebastião de Oliveira Reis, Florentino Vianna Hansted; Speaker, Alceu Vicente W. de Carvalho.

—H. Martins da Silva, President
Sociedade Brasileira de Estatística

CZECHOSLOVAKIA

The High Economic School at Prague publishes occasional volumes of research papers on problems of economics and economic statistics. The volumes have individual titles, with the general title *Vedecký Sborník Vysoké Školy Ekonomické* (Scholarly papers of the High Economic School). Recent titles include:

The use of sample surveys in economic statistics (1958).

Some questions of economic accounting (1959).

Questions of definition and measurement of the social product (1959).

Some problems of tracing personal consumption (1960).

The papers are published in Czechoslovakian, with summaries in Russian and German.

—High Economic School
Prague

EL SALVADOR

The Faculty of Economics of the **University of El Salvador** has resumed publication of its scientific journal *Economía Salvadoreña*, with the appearance of issue Number 18 in 1960. This issue, nominally dated July-December 1958, completes the fifth volume of the journal.

An editorial states that the purpose of the journal is to offer to students of the problems of national economics a vehicle of exclusively technical character for the publication of their studies and also to reprint articles by foreign authors. Beginning with Number 18, the journal contains a section devoted to Documents, which will include international treaties and other documents—official or private—to make source materials readily available. Future plans include the addition of sections for bibliographic surveys, review articles, and reprints of published materials which are not now readily available.

—*Economía Salvadoreña*
San Salvador

GERMANY

Monograph No. 10 of the **German Statistical Society** has been published, entitled *Statistische Vorlesungen und Übungen an Universitäten und anderen Hochschulen der Bundesrepublik vom Wintersemester 1955-56 bis Sommersemester 1958*. This 82-page catalogue of lectures and exercises, covering a period of six semesters, is available (price DM 2.-) from:

Deutsche Statistische Gesellschaft
Neuhauser Strasse 51
München 2, Germany

—German Statistical Society

HUNGARY

The Hungarian Academy of Sciences has created a Presidential Committee for Demography. The chairman of the committee is Professor György Péter, President of the Central Statistical Office, and the secretary is Dr. Egon Szabady, Head of the Population Department of the Central Statistical Office. In addition to demographers, the committee includes representatives of economics, planning, history, law, ethnography, geography, mathematics, biology, anthropology, public health, and medical sciences. The committee will coordinate research work, organize lectures and conferences, and will foster publications and international scientific exchanges in population sciences.

—*Demográfia*
Budapest

INDIA

The 13th Annual General Meeting of the **Indian Society of Agricultural Statistics** was held at Poona, January 8-10, 1960. It was inaugurated by Shri Y. B. Chavan, Chief Minister of Bombay. A technical address on "Planning for agricultural development in India" was delivered by Prof. D. R. Gadgil. In the session, there were two symposia. One of the symposia was on "Problems of estimation of National Income from Agriculture" which was presided over by Dr. N. S. R. Sastri of the Reserve Bank of India, Bombay. Those who participated in this symposium included amongst others, Dr. S. G. Tewari from C. S. O., New Delhi, Shri J. K. Pande from Lucknow, Shri V. N. Dandekar from Poona, Shri Daniel Thorner of the Indian Statistical Institute, Bombay Branch, Shri R. Giri, Statistician, Govt. of Madhya Pradesh, and Dr. P. K. Mukerjee of the Directorate of Economics and Statistics. The other symposium was on "Chinese Methods of Agriculture" which was presided over by Shri R. K. Patil. The speakers in this symposium were Prof. D. D. Kosambi of the Tata Institute for Fundamental Research, Bombay, Shri S. P. Mohite, Director of Agriculture, Bombay State, and Dr. D. A. Gadkari, Bombay Government. There was a popular lecture on 'Co-operative Farming' by Shri R. K. Patil. It was presided over by Prof. D. G. Karve, Vice-Chancellor of Poona University.

—*Statistical News Letter*
New Delhi

NETHERLANDS

The Central Bureau of Statistics publishes a series entitled *Statistical Studies*, containing English translations of reports of methodology and of other articles originally published in Dutch. Issues of *Statistical Studies* are published at irregular intervals by

W. de Haan N.V.
Zeist, Netherlands.

The most recent issue, No. 10 (July 1960), contains two articles from the quarterly *Statistische en econometrische onderzoekingen*.

POLAND

A new journal, *Folia Oeconomica Cracoviensia*, is being published from 1960 by the Commission on Economic Sciences of the Cracov Section of the **Polish Academy of Sciences**. Papers are published in Polish with summaries in English and Russian. Additional information may be obtained from the Editors,

ul. Slawkowska 17
Kraków, Poland
—*Folia Oeconomica Cracoviensia*
Cracov

The **High Economic School of Cracov** publishes a series entitled *Zeszyty Naukowe* (Scientific Publications). Recent titles include, in 1959,

No. 6: Works from the sphere of political economy,

No. 7: Works from the sphere of statistics, econometrics, and accounting.

Each issue contains a collection of papers in Polish with summaries in English and Russian.

—*High Economic School*
Cracov

INTERNATIONAL CONFERENCE ON INPUT-OUTPUT TECHNIQUES

The International Conference on Input-Output Techniques originally scheduled to be held from August 28 through September 1, 1961 at the Palais des Nations, Geneva, Switzerland, will now take place during the week of September 11 through 15, 1961. The Conference is being organized by the Harvard Economic Research Project, Harvard University, in association with the United Nations Secretariat. Professor Wassily Leontief, Harvard University, will act as Chairman of the Conference; Dr. Elizabeth W. Gilboy, Harvard University, as Secretary General.

The Conference is open to interested economists and statisticians. Those who wish to attend should write to Dr. Gilboy at the Harvard Economic Research Project, 1583 Massachusetts Avenue, Cambridge 38, Massachusetts.

—Dr. Elizabeth W. Gilboy
Harvard University

Virginia Todd Venneman, 1906-1960

Mrs. Virginia T. Venneman, whose retirement from Government service and as Correspondent for Federal Statistical Activities for *The American Statistician* was announced in the October issue, died of cancer on November 16. Mrs. Venneman was born in St. Louis and was a graduate of Washington University, from which she also received a Master's degree in 1929. She was on the staff of the New School for Social Research in New York City from 1929 to 1936, and was the editor of numerous books and articles in economics and political science. In 1943 she joined the Office of Statistical Standards of the Bureau of the Budget, where she was responsible for the preparation and publication of special reports as well as the monthly *Statistical Reporter*. Her last major editorial work was the 1959 revision of "Statistical Services of the United States Government"—a basic reference document on the statistical programs of the U.S. Government. Mrs. Venneman was widely known among statisticians, including those in foreign statistical offices as well as those in the Federal government. She is survived by her husband, Harry Venneman, her mother, Mrs. Luther Todd, two sisters and a brother.

W. S. Woytinsky, 1885-1960

W. S. Woytinsky, the world-famous statistician and economist, died last summer. He was born in St. Petersburg, Russia, and attended the University of St. Petersburg. When he first came to the United States from France in 1935, he worked as a consultant to the Central Statistical Board (now Office of Statistical Standards, Bureau of the Budget) on statistics for social security, a program which was just beginning. Later he served as an economic adviser to the Social Security Board on economic projections, unemployment compensation financing, and other subjects. After World War II, he and his wife, Emma, produced the monumental work, *World Production and Resources*. During several recent years he lectured in India, Japan and Latin America. The memoirs of his long and eventful life are soon to be published.

Ewan Clague
Commissioner of Labor Statistics



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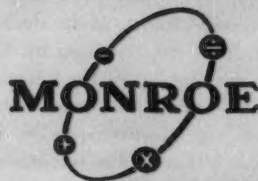
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FEDERAL STATISTICAL ACTIVITIES

CSC Revision of Classification Standards for Statisticians

The Civil Service Commission has prepared a tentative draft of standards for (1) revised classification standards for the statistics series, GS-1530-O, and (2) classification standards for a new mathematical statistician series, GS-15XX-O. The latter involves changes in qualification standards for mathematical statisticians. Comments on the draft have been requested from a number of members of the American Statistical Association, usually in their capacity as statisticians in various Federal statistical agencies. A meeting to review a first draft was held at the Office of Statistical Standards, Bureau of the Budget in June.

—Donald C. Riley,
Office of Statistical Standards,
Bureau of the Budget

Court Decision Affirms Confidentiality of Census Questionnaires

The United States Supreme Court refused, on November 7, to review a case concerning the confidentiality of respondents' file copies of industrial census schedules. In so doing, it left the decision of the U. S. Court of Appeals for the Seventh Circuit—and the guarantee of confidentiality—in effect.

The case arose out of an effort of the Federal Trade Commission to subpoena a file copy of the report made by the Beatrice Foods Company in Illinois to the Bureau of the Census for the 1954 Census of Manufactures. Beatrice Foods made the report on a schedule that carried the following statement: "CONFIDENTIAL—This report should be returned within 30 days of its receipt. This report is required by Act of Congress (13 U.S.C. 131). Your report is confidential and only sworn Census employees will have access to it. It cannot be used for purposes of taxation, investigation or regulation." The copy to be retained by the company carried the foregoing statement and also the following note: "KEEP THIS COPY FOR YOUR FILES." Retained copies are for use by the company in replying to further requests for information by the Bureau of the Census. The copy in question was so used.

The Federal Trade Commission contended that the guarantee of confidentiality in 13 U.S.C. applies only to the information in the custody of the Bureau of the Census and not to that in the company's files.

The Appeals Court, in its decision on April 4, 1960, quoted from a letter written by Robert W. Burgess, Director of the Bureau of the Census, in which he pointed out that the confidential relationship in census reporting is vital to its effectiveness. Dr. Burgess explained the situation as follows: "The sections of Title 13 dealing with confidentiality of Census reports were enacted for the purpose of protecting companies against any harm which might result from their complying with a Census report-

ing requirement. This privileged relationship enables the Census Bureau to require response to inquiries which are necessarily formulated on a uniform basis for all companies in a particular activity regardless of whether or not their books of record directly yield the requested information. For this and other reasons estimates and approximations are necessarily acceptable in statistical reporting to an extent that would not be acceptable for financial or certain other purposes. Furthermore, it is essential to the economical and speedy consummation of statistical programs that the rules governing reporting permit the companies to authorize subordinate officials to furnish information directly before formal clearance with comptrollers, auditors or company counsel, and that this information frequently be furnished before final figures have been developed in the company record system."

The Appeals Court concluded "that the Commission cannot compel the production of a copy of a census schedule in possession of the company that furnished the original thereof to the Census Bureau through enforcement of a subpoena *duces tecum*. To hold to the contrary, we believe, would run counter to the Congressional purpose of the Census Act and the assurances given by the Government to the public. These assurances of confidentiality and protection constitute a pledge of good faith on the part of the Congress, the President and the Department of Commerce. We do not think that another arm of the Government (the Federal Trade Commission) can be heard to say that such representations may be avoided in this indirect manner. The United States has given its word and should be permitted to keep it."

Revisions of Economic Indicators and Supplement

The Joint Economic Committee of the U.S. Congress has recently issued the *1960 Supplement to Economic Indicators*. At the same time a number of revisions have been introduced in the monthly *Economic Indicators*.

Economic Indicators is prepared for the Joint Economic Committee by the Council of Economic Advisers. It systematically presents each month selected tables and charts most commonly used to watch economic trends. The revisions introduced starting with the November 1960 issue tend to show more seasonally adjusted data, expanded coverage of some subjects, such as unemployment, and new series as, for example, the balance of payments.

The *1960 Supplement to Economic Indicators* was prepared by the Office of Statistical Standards, Bureau of the Budget, in cooperation with the data producing agencies. The contents follow closely the material in the monthly publication but provide longer annual series and background information, including such items as seasonal adjustment factors for the monthly and quarterly series and relative weights for the indexes. This is part of a pattern which includes descriptions of the various series,

the statistical procedures used in preparing the series, the relation to other series, uses and limitations of the data, and references to further background information. A new feature of the 1960 revision is the inclusion of background charts, based mostly on monthly and quarterly data.

Economic Indicators, published monthly, is available by subscription for \$2.00 a year from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. The 1960 Supplement to *Economic Indicators* is also available from the Superintendent of Documents.

—James W. Knowles, Staff Economist,
Subcommittee on Economic Statistics,
Joint Economic Committee

BLS Industry Employment Statistics Program

The Bureau of Labor Statistics recently passed the half-way mark in the massive task of completely revising its national industry employment, hours, and earnings statistical program. The occasion for this revision is the transfer to the new Standard Industrial Classification (SIC), issued in 1957, and the incorporation of first quarter 1959 benchmark levels stratified by size (SR No. 270, June '60, p. 96). Other major technical improvements are being made at the same time. These include size stratification in making current estimates, improved universe estimates of employment as benchmarks, and transfer of the current estimates to more modern electronic computing equipment.

The switch to the 1957 SIC has been carried out in several steps. During 1958 the cooperating agencies of the states and the District of Columbia reviewed the activities of the 120,000 reporting units in the current monthly sample and assigned industry codes according to the 1957 SIC. This new information was transmitted to BLS in Washington where it was used to recode each report previously submitted for current monthly estimates, beginning with data reported for January 1958.

More than 4,000 statistical series showing employment, hours and earnings based on the 1957 SIC will be produced by the retabulation of the recoded reports for each month in 1958, 1959, and 1960. (The present system provides data for 3,000 series based on first quarter 1957 benchmarks.) During the last part of this year and the first few months of 1961 these series will be reviewed for statistical adequacy and processed for publication. It is expected that the new series will replace

the presently published monthly data on payroll employment statistics as the Bureau's official series in the spring of 1961.

Replacement series, based on the concepts of the 1957 SIC, for broad industry divisions and 2-digit manufacturing industries will generally be carried back to various dates corresponding to the beginning of present series (1947 or earlier). For the detailed industry series for which the 1957 SIC made significant changes, however, data will generally not be available prior to January 1958.

Other important technical improvements have been undertaken as an integral part of the reconstruction process. The estimating process will include appropriate weighting of reports by size and, in some cases, by region since it was found after extended and intensive study of the universe data and reports from the sample that significant improvements could be made for many hourly earnings series by the introduction of these procedures. The benchmark and monthly estimating framework of the program have been stratified below the narrowest industry level.

The program was previously based on some 400 industry estimating cells. The new estimates will be constructed from over 800 industry-size estimating cells. Size boundaries were determined for each industry separately and not all industry estimating cells were found to require size stratification. For manufacturing, only slightly more than half are to be so treated. On the other hand, industries in the trade division, for example, will be stratified by size, by region, or by a combination of both.

Additional technical improvement will result from the development of new and improved sources of benchmark data for employment outside the social insurance system, particularly for the service division. For example, new benchmark sources of data on employment for charitable and religious organizations will yield substantial improvement in the levels of employment estimates for segments of the service division. Further progress is also anticipated in the development of machine review of the data as a means of controlling and maintaining the quality of the statistical series.

Seasonably adjusted data will be available for the new series concurrent with the publication of the unadjusted series in about the same detail as presently published.

—Dudley E. Young, Assistant Chief for Statistics
Division of Manpower and Employment Statistics
Bureau of Labor Statistics

Future Annual Meetings of ASA are as follows:

<u>YEAR</u>	<u>PLACE</u>	<u>HEADQUARTERS</u>	<u>DATES</u>
1961	NEW YORK CITY	ROOSEVELT HOTEL	DECEMBER 27-30
1962	MINNEAPOLIS	LEAMINGTON HOTEL	EARLY SEPTEMBER
1963	CLEVELAND	CASE INST. OF TECH. AND WESTERN RESERVE UNIV.	EARLY SEPTEMBER
1964	CHICAGO	CONGRESS HOTEL	DECEMBER 27-30
1965	PHILADELPHIA	BELLEVUE-STRATFORD HOTEL	EARLY SEPTEMBER

FILTERING IN GEOLOGICAL SAMPLING

William F. Tanner

Florida State University

Censoring of statistical data involves the suppression of part of the desired information concerning a sample, within a certain range of values. The missing data normally belong to one or both tails, but might conceivably be taken from the middle. In most cases the number of suppressed classes is known, or the total number of suppressed items is known, but measurements representing the individual items are not recoverable. Censorship is a relatively mild form of restriction, or selection, and for many purposes in practical statistics does not handicap the analyst at all. Sediment samples, of interest to geologists, are almost invariably censored at the "fine" (rather than the "coarse") end, because of the nature of the measuring process (sieving); no loss of significant information is involved within the size range being studied.

Truncation involves the total removal of information concerning a continuous set of values in part of the distribution. This may occur in one or both tails. No data are available as to the number of missing items, or the number of missing classes. For this reason, truncation is a more severe form of selection than is censorship. Each of these restrictions has been handled in some detail in the statistical literature (for a general bibliography, see Mendenhall, 1958).

In geomorphological sampling, even more severe restrictions appear. The land surface over a given area can be represented by a series of elevation determinations (perhaps at grid corners), which can be classified in the usual manner, and represented by various standard parameters. Where a very simple surface exists, a Gaussian distribution (with or without a suitable transformation) may be expected. But not all areas are represented by simple surfaces. Tectonic uplift of a region, or a drop in sea-level, or a climate change, or a forest fire, or some other event, may initiate a new cycle of gully- and eventually valley-cutting. Under such, rather common, circumstances, a new land surface develops at a lower elevation, specifically at the expense of the older, higher, surface. This rejuvenation process might be spread over many thousands of years. At any given instant (such as today), the area may be covered by parts of both surfaces, intimately intermixed. The complex nature of the drainage pattern, and the fact that the younger surface develops along the drainage lines, can be expected to produce a situation where higher parts of the younger, lower, surface are higher than lower portions of the older, high, surface. The two distributions overlap badly.

Because destruction of the older, higher, surface occurs along narrow drainage channels rather than as in a broad, sweeping, bull-dozer like attack, the lower portion of that surface is destroyed, at first, only par-

tially. For example, of 20 relief classes, at a given moment, the 14 highest (above sea-level) may be preserved intact, whereas each of the lowest six may have been reduced, percentagewise, either a little or a great deal. Because the bounds of an area can, in few cases, be specified with great assurance, it is impossible to reconstruct, directly, the original distribution.

It is here proposed that the partially suppressed distribution be referred to as a filtered distribution, and that the effective agency be noted as a statistical filter. Filtering differs from truncation in that there is no clearly specified line between known and unknown data: missing items may have been taken out of the original distribution, here and there, according to the characteristics of the filter. Filtering differs from censorship in that some of the information about only some of the items is missing, and further that it is not known how many items have been so affected.

Suppose one wished to experiment by tossing beans from a fixed location into square bins, arranged immediately adjacent to each other, in a line. When the experiment is completed, the beans in the bins will represent a distribution of some kind. If an assistant should cap the first r bins, at one end of the line, without the knowledge of the operator, and then collect (and count in a single category) all of the beans which bounced off of the caps, a censored distribution would result. If, however, he capped the first r bins, without collecting the beans which bounced off of the caps, a truncated distribution would result. For a filtered distribution, the assistant would be instructed to cap only certain bins, in some definite order: every second bin, of the first r bins, or every third bin, or according to some other pattern in space or time. Furthermore, those beans which bounced off of the capped bins would be considered lost.

It should be clear that the nature of the filtered distribution will depend, in part, on the statistical distribution which characterizes the filter.

The geomorphic illustration given above was simplified overly, in an effort to clarify the notion of filtering. Actually an additional complication may be present. At a given location, and at a given elevation, a high edge of the newer, lower surface, may fail to develop because the rocks at this point and elevation had been removed, previously, in the history of the older, higher surface. Hence it is necessary to consider that each distribution, in effect, filters the other. The term, mutual filtering, is proposed for this phenomenon.

The assistant, in the experiment described sketchily above, would have to restrict the openings of certain

(Continued on Page 21)

ON SMOOTHING AND LAGS

by

Herman O. Stekler

University of California, Berkeley

In the past when statisticians discussed the relationship between smoothing and lags, they were mainly concerned with the average lag that each smoothing formula imposed upon the unsmoothed data. It is easy to determine the average lag corresponding to each smoothing formula, for

$$L = \frac{\sum_{n=0}^N n \cdot A_{t-n}}{\sum_{n=0}^N A_{t-n}} \quad (1)$$

where L is the average lag, the $X_{t'}$ are the smoothing coefficients, and N is the number of coefficients utilized [1].

For at least one class of formulae, one can also do the converse (i.e. choose the desired average lag and thus quickly determine the corresponding smoothing coefficients. These smoothing formulae are of the form:

$$Z_t = (1-a)X_t + aZ_{t-1} \quad 0 < a < 1 \quad (2)$$

$t=0, 1, 2 \dots$

where the $Z_{t'}$ are the smoothed and the $X_{t'}$ are the original values. Equation (2) can be expanded to

$$Z_t = \sum_{n=0}^N (1-a)(a)^n X_{t-n} \quad 0 < a < 1 \quad (3)$$

$t=0, 1, 2 \dots$

The average lag of the Z_t series over the X_t series can now be calculated from (1) and (3). The sum of the coefficients of (3) equals unity, for $(1-a)(a)^n$, $0 < a < 1$ is a geometric progression, the sum of whose terms for large values of n is unity. The numerator to be inserted in (1) corresponding to our particular smoothing formula is only slightly more difficult to calculate.

$$\begin{aligned} \bar{L} &= (1-a) \cdot (0) + (1-a) \cdot (a) \cdot (1) + (1-a) \cdot (a^2) \cdot (2) + \\ &\quad \dots + (1-a) \cdot (a^n) \cdot (n) \quad 0 < a < 1 \\ &\quad \text{or} \quad (4) \\ L &= (1-a) \cdot (a) [1 + 2a + 3a^2 + 4a^3 \dots n(a)^{n-1}] \quad 0 < a < 1 \end{aligned}$$

The bracketed portion of (4) is the expansion of $(1-a)^{-2}$. Therefore,

$$L = \frac{a(1-a)}{(1-a)^2} = \frac{a}{1-a} \quad 0 < a < 1 \quad (5)$$

For any desired lag, L , the coefficients of one particular class of smoothers can now be determined from (5).

The application of (5) and the computational ease of using formula (2) can be illustrated by an example. We would like to smooth a series, X_t , sufficiently so that the smoothed series Z_t , is lagged, on the average, three months behind the unsmoothed. Inserting $L=3$ in (5), we obtain the result $a = 3/4$. Thus our smoothing formula is: $Z_t = 1/4 X_t + 3/4 Z_{t-1}$

REFERENCES

- [1] Lawrence R. Klein, *Econometrics*, (Row, Peterson and Company, Evanston, Illinois, 1953), p. 315.
- [2] This expansion, of course, can only be made when $N \rightarrow \infty$

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THE ORGANIZATION OF STATISTICAL INSTRUCTION IN COLLEGES AND UNIVERSITIES¹

T. A. Bancroft
Iowa State University

1. Introduction

With the rapid increase in the number of departments of statistics² at colleges and universities, it seems appropriate at this time for the statistical societies to give serious consideration to the present status of course programs for students majoring in statistics and in addition to review offerings of course programs in statistics of a purely service nature. Also it would seem desirable to consider ways of improving such programs and possibly even attempt informal agreement on some common core of knowledge which statisticians graduating with bachelor, master and doctoral degrees might reasonably be expected to have.

2. Assumptions

For the purpose of this discussion we shall assume that: (i) the body of scientific knowledge comprising theory and method, generally known among informed persons as statistics, is now of sufficient substance and extent to warrant classification as an independent academic discipline, and (ii) where feasible, and at least in the larger colleges and universities, it is desirable to encourage the establishment of departments or sub-departments of statistics for the main purpose of providing undergraduate and graduate course programs of some breadth and depth and at the same time coordinated in nature.

3. Deductions

Granted the assumptions (i) and (ii) above, it would seem to follow that, if statistics is to be considered an independent discipline, then it would be highly desirable to attempt informal agreement on some common core of knowledge which statisticians graduating with bachelor, master, and doctoral degrees might reasonably be expected to have. Such informal agreement on a common core of knowledge at the three degree levels would presumably lead to informal agreement on the organization of course programs whose content would include the accepted common core of knowledge. For purposes of reference we shall designate these as common core course programs for bachelor, master and doctoral majors in statistics. It would be expected that considerable variation would exist among colleges and universities as regards the kind and content of additional non-common core course program requirements for the three degrees with major in statistics. In addition

considerable variation among higher educational institutions would be expected as regards kind and content of course offerings of a purely service nature.

4. Advantages of Common Core Course Programs

It is obvious that common core course programs would need constant revision in order that account could be taken of growth in the science of statistics and accumulated teaching experience. Even so, at any given time, common core course programs established at reasonably high quality levels, should upgrade, and at the same time make more homogeneous, the educational backgrounds of statisticians having completed any particular academic degree with major in statistics. Even though established at reasonably high quality levels, it would seem desirable to look upon common core course programs as minimum and partial degree requirements. This would place a floor under the educational backgrounds of academically trained statisticians and at the same time permit variation in the direction of increased quality.

5. Difficulty of Agreement on Content of Common Core Course Programs

Since the interests and academic backgrounds of the members of the statistical societies are so varied, it is realized that it may be difficult to achieve informal agreement on specific courses and their content suggested to form common core course programs. Further, it may also be difficult to achieve such informal agreement even among the presently established departments of statistics at colleges and universities throughout the country. Even so, it would appear desirable to make the attempt.

6. Roles of Theory and Applications in Course Programs in Statistics

One point of disagreement appears to be the relative role given to mathematics in course programs in statistics. Alternatively there appears disagreement on the relative role of applications in the educational programs in statistics. To some statisticians these disagreements seem pointless now. It seems obvious that a very good mathematical background is needed by the statistician who develops new statistical theory and methodology. On the other hand it seems equally obvious that most new problems, requiring the development of new statistical theory and methodology will be suggested by considerations from fields of application.

The situation in statistics, I believe, is analogous to that suggested for science in general by Alex de Tocqueville in "Democracy in America":

"The mind, it appears to me, may divide science into three parts.

¹ Presented at a joint session of The Institute of Mathematical Statistics and The American Statistical Association, Washington, D.C., December 27-30, 1959.

² Within the past year separate departments of statistics have been established at Florida State University and Kansas State University and it is expected that an announcement of the establishment of such a department at the University of Wisconsin will be made soon.

"The first comprises the most theoretical principles and those more abstract notions whose application is either unknown or very remote.

"The second is composed of those general truths that still belong to pure theory, but lead nevertheless by a straight and short road to practical results.

"Methods of application and means of execution make up the third.

"Each of these different portions of science may be separately cultivated, although reason and experience prove that no one of them can prosper long if it is absolutely cut off from the other two."

If the analogy is appropriate, then it would seem desirable to include some material from each of the three corresponding analogous divisions of statistics, at least in the graduate common core course programs. Specialization by students in any one of the three areas might then be attained by taking additional work classified as non-common core course program requirements. It may well be that many colleges and universities, because of type, size and/or interests may not be able to provide advanced specialization opportunities in all three areas.

With the constantly increasing demand for able statisticians by industry and business and government agencies there is a need for a great many applied statisticians at present; however, in order to understand the assumptions and limitations of various alternative methods which might be used in a given practical situation, it is highly desirable that applied statisticians have substantial backgrounds in mathematics and theoretical statistics. Unfortunately, applied statistics, as has been pointed out before, does not consist of the selection of a *specific* statistical tool from among those available to fit a given practical situation, but in many situations it calls for the selection of the best one among several tools none of which fit exactly. Alternatively it may be necessary to modify some existing method or even to develop a new methodology. These considerations require a knowledge of mathematics and statistical theory. On the other hand a mathematical or theoretical statistician who divorces himself from applications may find himself working on trivial or non-relevant problems as far as the overall development of the science of statistics is concerned. Further, unless a statistician, specializing in mathematics and statistical theory, has some contact with methods and applications in his educational course programs, it is doubtful that he will appreciate their importance in suggesting new problems of research in statistical theory.

In view of the above considerations it would seem desirable to arrange common core course programs which provide training in mathematics and theoretical statistics as well as methods and applications. Further that there be an attempt to relate, rather than to keep separate, theory and applications in the common core course programs.

7. An Illustration of Common Core Course Programs in Statistics

*For purposes of illustrating and to provide a point of departure for future discussion it would seem desirable at this time to present brief descriptions of the common core course programs in statistics which have been developed at Iowa State University over a period of some 35 years.

(i) B.S. majors in statistics. Usually requires 4 years beyond high school graduation.

General requirements are a minimum of 15 quarter credits in each of the following seven groups: (a) written and spoken English; (b) mathematics (at least 10 hours), statistics; (c) chemistry, physics, geology; (d) botany, zoology, bacteriology, genetics; (e) economics, sociology, psychology, government; (f) history, literature, philosophy; (g) modern language.

Special requirements in mathematics usually include the following courses beyond sophomore calculus: theory of equations and differential equations. Some students also take matrix algebra and advanced calculus. Special requirements in statistics usually include the following courses: principles of statistics (freshman or sophomore level); two quarters of general theory using sophomore calculus; two quarters of general methods; a methods course in survey sampling, a methods course in experimental design. Some students also take a course in business statistics and/or a course in quality control.

(ii) M. S. majors in statistics. Usually requires 1½ to 2 years beyond the B.S. General requirements include a reading knowledge of one foreign language and an acceptable thesis which may involve the development of new statistical theory and/or methodology or the sophisticated application of known statistical theory and/or methodology in a field of application.

Special requirements in mathematics include a minimum of two quarters of advanced calculus and one quarter of matrix algebra. Special requirements in statistics include the following courses: three quarters of intermediate general theory, a quarter of intermediate methods, a two-quarter course in theory and methods of experimental design, and a two-quarter course in theory and methods of survey sampling. In addition M. S. candidates may elect an applied course or courses at the intermediate level from: genetic statistics, economic statistics, biological statistics including bioassay, psychometrics, and industrial statistics. Elective courses are also available in more advanced theory courses and in scientific machine computing using high speed electronic computers.

(iii) Ph.D. majors in statistics. Usually requires 3 to 4 years beyond the B.S. degree which would include the M.S. or its equivalent in statistics. General requirements include a reading knowledge of two foreign languages, usually selected from among French, German and Russian and an acceptable thesis which must involve the development of new statistical theory and/or

methodology. In other words an original contribution to statistics per se rather than an application of known statistical theory and/or methodology. Two minors are required, one being mathematics and the other a substantive field of application. Special requirements in mathematics in addition to that required for the M.S. usually include the following courses: intermediate and/or advanced abstract algebra, intermediate and/or advanced complex variables, a two-quarter intermediate course in probability and an advanced two-quarters of functions of real variables. Special requirements in statistics beyond the M.S. include the following courses, one quarter of advanced probability and distribution theory, one quarter of advanced estimation and tests of hypotheses, one quarter of advanced multivariate analysis, one quarter of the theory of general linear hypothesis, one quarter of advanced general methods, and a selection of two quarters of advanced experimental design or advanced survey sampling design or advanced econometric statistics or advanced general theory.

(iv) Joint Ph.D. in statistics and some substantive field of application. Instead of offering a Ph.D. in applied or experimental statistics arrangements are made for joint Ph.D. programs. The general requirements are the same as for the Ph.D. in statistics per se except that the thesis may involve a sophisticated application of known statistical theory and/or methodology to a problem in the substantive field of application. The common core course program for the joint Ph.D. includes the course requirements in mathematics and statistics for the M.S. with major in statistics plus at least four additional courses in statistics at the advanced level.

(v) Ph.D. minors in statistics. A great many graduate students majoring in some substantive subject matter area at Iowa State University choose to minor in statistics in order to acquire a working knowledge of statistics as a research tool. Some knowledge of undergraduate college mathematics through differential and integral calculus is required. Special requirements in statistics usually include the following courses: one quarter of principles of statistics, two quarters of general methods, two quarters of general theory using calculus, and a selection of at least two quarters from: experimental design, survey sampling, genetic statistics, economic statistics, industrial statistics, psychometrics, biological statistics including bioassay.

Finally it should be mentioned that many undergraduate students from various departments take only the one quarter course in principles of statistics to add to their general knowledge. Further some undergraduate and graduate students not majoring in statistics take one or more courses beyond the principles course.

8. Advantages of a Statistical Institute or Laboratory Administratively Related to the Department of Statistics

In addition to providing a valuable service to research staff in various substantive fields over a university

campus, a statistical consulting and scientific computing institute or laboratory related to the department of statistics offers great advantages to the teaching and research programs in statistics per se. Such an arrangement should provide an optimum climate for the interaction and coordination of theory and applications. Also a related institute or laboratory would provide the opportunity for team research on scientific problems as between the statisticians and research staff in substantive fields as well as among the statisticians themselves.

It would seem desirable that the scientific computing service of such an institute or laboratory be equipped with or have access to a high speed electronic computer. These facilities are changing present approaches and permitting different approaches to many old and new statistical problems. This revolution in attacks on statistical research problems made possible by high speed electronic computers is likely to continue.

9. Instructional Programs in Statistics at Smaller Colleges and Universities

The form of the organization of statistical instruction in colleges and universities should depend upon such factors as the type, size, interests, and needs of the particular college or university in question. Many smaller colleges or universities may find that it is not feasible to organize a separate department or even subdepartment of statistics. In such cases a departmental home should be found for at least a general principles course in statistics at the freshman or sophomore level and a beginning general course in theoretical statistics with calculus as prerequisite. This latter course, in such cases, would logically be offered in the mathematics department. In addition more specialized beginning and advanced methods courses would naturally be offered in such cases, in the respective departments of the specializations.

10. Retraining and Refresher Instructional Programs for Practicing Statisticians

In his presidential address "Statisticians—Today and Tomorrow" Walter E. Hoadley, Jr. the immediate Past President of The American Statistical Association, called for the establishing of a comprehensive refresher training program "to improve the general level of statistical techniques in use, to improve statistical understanding, and to win wider membership support for our association." Because it is in the academic tradition to treat subjects in a broad and fundamental way it would seem desirable that the teaching of refresher courses should be done for the most part in the universities. In such case it would seem desirable to use able industrial and government statisticians for some lectures and special seminars in refresher instructional programs. A good example of this was the excellent series of seminars on survey sampling techniques presented by Dr. Edwards Deming at the Summer Institute for College Teachers of Statistics sponsored by the National Science Foundation last summer at the University of Wyoming.

(Continued on Page 21)

THE TEACHING OF STATISTICS IN CANADA

E. F. Beach
McGill University

A recent survey by the Federal Government's Bureau of Statistics discovered nineteen universities offering introductory courses in statistics out of a total of thirty-six degree granting institutions across Canada. Many of the nineteen were offering more than one introductory course—frequently there was one offered for business, economics or commerce students, and one offered by the mathematics department. Occasionally other departments such as psychology, sociology, and genetics offered courses specifically for their own students. Eleven universities were found to offer courses beyond an introductory one.

It can be assumed that this tabulation, taken from university announcements, is incomplete and probably not up-to-date, since changes are constantly being made. In particular, there are evening or extension courses with or without university credit which doubtless have been omitted from the list because such courses are frequently not mentioned in the announcements.

The history of the teaching of statistics at McGill University in a department which is not mathematics is probably typical of the practice at some other universities. An early course which dealt with sources and types of statistics with little analysis, has, over the years, been turned into an introduction into the handling of statistical data with gradually increasing emphasis on sampling theory. For twenty years such a full year's course has been compulsory for all commerce students. Additional courses have been added in special fields and by various other departments, including psychology, sociology, and genetics. The mathematics department has developed its own courses. There has, in addition been a very important change in interest in the general field. A generation ago in a department of Economics, the course in statistics was something which was added because it was felt to be a necessary evil, but it was handed over to the member of the department least able to object—usually the youngest member. One indirect and not unimportant result of this policy is that some of these younger people developed a genuine interest in the field. The situation has changed so much now, that every department of Economics feels that it must have at least one good man in the "quantitative field." This interest is emphasized by the demands of government departments and business for young people trained in these methods; even during the recent softening in the market for university graduates in general there was no lessening in the demand for people who have adequate training in this field.

It is usual for the department of mathematics to play a central role in the teaching of statistics, and increasing numbers of courses in mathematical statistics are appearing. Four universities, Montreal, McGill, Toronto and British Columbia, now have computing centres.

Toronto has developed a special programme in mathematical statistics; other universities offer some courses in statistics as part of their general mathematics programme, both graduate and undergraduate. Arrangements are worked out with other departments so that students who are primarily interested in mathematics can get enough mathematical background for their statistical studies.

In most of the larger universities the student may choose to take an honours programme rather than a general, or pass programme. The honours programme requires more work, higher grades and generally special courses of more substantial content. They may imply more specialization in a particular field; usually they imply a set of courses that are more carefully planned for graduate work, for teaching or other professional interest in the field. Several universities have joint honours curricula in two fields such as economics and mathematics. The better students tend to choose the honours curricula. Thus a student who graduates with a second class honours degree will be better trained than one who obtains first class grades in general or pass courses.

The length of the Canadian academic year is less than that in the United States, a fact which stems in part from the need for students to be free for summer work, especially according to earlier tradition, work on the farm, and partly because the Canadian universities have in their earlier years been under the influence of the British universities. Lectures begin late in September and examinations finish in early May or even late April.

A "full" course is one which runs throughout the year, with perhaps three lecture hours per week. A "half" course would be offered either in the first term or the second term.

The contents of the honours curricula are essentially in the hands of the departments and vary greatly within a university as well as between universities. Let us take a few examples:

McGILL UNIVERSITY

Mathematics:

For the Department of Mathematics, courses in statistics may be taken by four different sets of students:

(a) A full course in *Elementary Statistics* may be taken by any student after he has had his first year mathematics which is compulsory for all students in Arts, Science or Commerce and a first course in calculus. It emphasizes basic concepts with a minimum of mathematics.

(b) A general student may take a group of three courses in mathematics, known as a "continuation in mathematics." One of these courses could be the course in statistics mentioned above.

(c) A student may take a "General Degree with Spe-

cial Distinction in Mathematics." This requires him to take two honours courses in mathematics in each of the second and third years, but he has no chance to take any statistics until the fourth year and then he would have difficulty because of prerequisites.

(d) A student taking full honours in mathematics has his time well occupied. In his second year he takes three full honours courses in mathematics and two other approved courses normally not in mathematics. In his third year he takes four full courses in mathematics (or equivalent in half courses) two of which must be honours courses. A fifth course cannot be mathematics. His fourth year is much the same as the third year. In his four years of university work he could have taken a half course in *Mathematical Statistics* (more mathematical than the one mentioned above), a course in *Advanced Mathematical Statistics* including design of experiments, analysis of variance and multiple regression, and a course in *Probability* in which the student would study subjects ranging from genetical problems to the theory of cascades.

(e) Students may take joint honours in Economics and Mathematics, or joint honours in Mathematics and Philosophy, in which case the student would take six or seven full courses in mathematics out of 18 full courses in his four years at the university. Some of these mathematics courses would normally be in statistics.

Some of these undergraduate courses in statistics have been expanded from half courses, as part of a recent expansion in the statistical teaching in the department. In the Graduate Faculty the Department of Mathematics offers 52 graduate courses of which four are in the field of statistics and probability.

Other Departments

Commerce students must take in their third year a full course in *Business Statistics*. Texts used have been *Applied General Statistics* by Croxton and Cowden and *Modern Business Statistics* by Freund and Williams.

There is an honours course in *Economic Statistics* available for honours undergraduate and graduate students. In addition there is a full course in *Mathematical Economics* and a full course in *Econometrics*.

The Department of Genetics offers a full course in *Biometry* and a half course in *Design of Experiments*.

Other faculties of the University offer courses in statistics, particularly the Faculty of Agriculture.

UNIVERSITY OF MONTREAL

* There being no Faculty of Arts and Sciences as such at Université de Montréal—a sizable proportion of students entering the campus with B.A. degree—the situation is somewhat different from that of other Canadian universities. Some faculties are engaged only in graduate work whereas some other faculties have both undergraduate and graduate sections.

Elementary courses in statistics are being offered in various fields. For instance, introductory courses in statistics dealing with descriptive statistics and also basic principles are to be found in Sociology, Economics, Psychology, Biology, Commerce and Engineer-

ing. More advanced courses requiring a more sophisticated mathematical background appear in the curriculum of students in these departments at a higher level. For example, a half course in biometrics is a prerequisite to Honours students in Biology, a half course on regression analysis and related techniques is compulsory for Honours students in Economics, etc.

The Department of Mathematics offers a whole series of advanced statistics courses to its students. A full course deals with the probability theory and mathematical statistics at the advanced calculus level. Several half courses, dealing with particular topics, are offered to Honours undergraduate students and graduate students; courses such as those on regression analysis, on sampling theory, on design of experiments, on analysis of variance, on sequential analysis, on advanced probability theory eventually lead to M.Sc. degrees in mathematical statistics. Other advanced courses on multivariate analysis, on theory of estimation and of testing of hypotheses, on non-parametric methods and so forth are offered to students at the Ph.D. level.

UNIVERSITY OF TORONTO

There are both pass and honours courses offered in statistics. Within the Honours Curriculum in Mathematics, the following sequence of courses is offered for those who want to pursue statistics:

Second year: a half course in Probability (1 hour a week)

Third year: a heavy course in Probability and Statistics (3 hours), based on Fraser-Statistics—An Introduction

Fourth year: a full course in Inductive Inference (2 hours)
a full course in Analysis of Variance and Regression Theory (2 hours)
a full course in Advanced Probability Theory (2 hours)

Graduate courses cover such topics as Non-Parametric Theory, Design of Experiments, Stochastic Processes, Theory of Sampling, etc.

The Department of Mathematics offers courses outside the department as well:

1. A sequence in the General Course, available also to Commerce and Finance, made up of a second year course in Probability and a third year course in Statistics.

2. A second year course for physicists and astronomers.

3. A third year course for Honours Science, i.e. Biology, Physiology, and Biochemistry, Food Chemistry.

4. A half course in Quality Control for some fourth year engineers.

5. Substantial courses to second year Engineering Physics and to second and third year Industrial Engineering.

6. Graduate course for engineers who have had no statistics. This course is also taken by graduate students in Meteorology.

Some statistics is taught by other departments, in particular economics, psychology and hygiene.

QUESTIONS AND ANSWERS

Edited by ERNEST RUBIN
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The Age Factor In Master Chess *

Recent events of a national character have called unusual attention to the prevalence of the age factor in human affairs. I refer to the recent political contest in the United States; the ages of the principal protagonists were a "young 43" and an "old 47" years. In the world of primarily physical sports most participants are retired from active competition before age 40. Ted Williams, the well-known baseball player, retired this fall at the advanced sport age of 42. Few athletes in baseball, basketball, football, soccer, boxing or track, to mention a few sports, reach their fortieth birthday on the active list.

A demographic examination of these sports would probably reveal interesting and significant differentials of average retirement ages. I would guess that these ages are about 30 years in football, 35 years in boxing and 38 years in baseball. In billiards and golf, sports in which there is a more equal balance between physical and mental exertion, the average retirement age of professionals is probably closer to 50 years. What can be said of the age factor in a purely mental sport such as master chess? (1)

The age spectrum of master chess play covers the biblical three-score and ten years. There are records of master players who were not in their teens and of players who engaged in active play until their mid-seventies. Paul Morphy (1837-1884), Jose R. Capablanca (1888-1942), Samuel Reshevsky (1911—), and Bobby Fischer (1943—), the current U. S. champion and international grandmaster, are a few of the players who exhibited remarkable chess power as children. James H. Blackburne (1842-1924), at 72, played in the great St. Petersburg tournament of 1914; Emanuel Lasker

was 68 when he retired from active competition in 1936. In this discussion, I am considering primarily the "aging" aspect, i.e., as the chess player ages, what can be said about the quality of his performance. Is master chess a young man's game?

I have used various statistical approaches to develop measurable results. First, I consider the ages of all world champions and of their successful challengers at the time of the critical match. Second, I examined the tournament performances of two players, Emanuel Lasker and Jose R. Capablanca for the period of their chess careers. Third, I obtained rank correlation coefficients between age and final standing of contestants in a number of international tournaments.

Earlier this year, Mikhail Tal, 23, defeated Mikhail Botvinnik, 49, for the chess championship of the world. Table 1 gives the relevant age data for the world champions and the successful challengers for the period 1858-1960. The arithmetic mean ages of champions and challengers are respectively, 44.7 and 32.8 years. The *t* distribution was used to test whether these means differ significantly; the result obtained was $P < .01$, that is, this difference of means is extremely significant. (2) At the highest level of chess, the age factor is quite discernible. It will be observed (Table 1) that in only two instances did an ex-champion regain the title.

The chess history of selected masters does not constitute a valid sample or a basis for generalization. These data are presented as suggestive rather than as conclusive evidence regarding the relationship between chess performance and aging. Between 1889 and 1936, Emanuel Lasker (3) participated in 21 international tournaments. He scored 239½ out of 321 points for a life tournament average of .746. Jose R. Capablanca's (4) tournament career covers the three decades 1910-39. During this

*For a related discussion on chess in this section, see *The American Statistician* of June 1957, "The Significance of the Initiative in Chess."

Table 1. World Chess Champions and Successful Challengers
by Age at Time of Critical Match: 1858-1960

Date of Match	World Champion	Age at Match	Successful Challenger	Age at Match
1858	A. Anderssen	40	P. Morphy	21
1866	A. Anderssen	48	W. Steinitz	30
1894	W. Steinitz	58	E. Lasker	26
1921	E. Lasker	53	J. R. Capablanca	33
1927	J. R. Capablanca	39	A. A. Alekhine	35
1935	A. A. Alekhine	43	M. Euwe	34
1937	M. Euwe	36	A. A. Alekhine	45
1957	M. Botvinnik	45	V. Smyslov	35
1958	V. Smyslov	36	M. Botvinnik	46
1960	M. Botvinnik	49	M. Tal	23

Source: *The World Almanac: 1959* (N.Y. World-Telegram and the Sun, 1959), p. 854. New York Times, May 14, 1960.

Table 2. Tournament Scores of Lasker and Capablanca, by Age

Age Group	Lasker			Capablanca		
	Games Played	Points Scored	%	Games Played	Points Scored	%
20-29	102	79½	.779	133	111	.835
30-39	58	48	.828	106	82	.774
40-49	36	28	.778	199	145	.729
50-59	59	45	.763	43	28½	.663
60-69	66	39	.591	—	—	—
Total	321	239½	.746	481	366½	.762

Sources: *Emanuel Lasker: The Life of a Chess Master*, by J. Hannak (Simon and Schuster, N.Y., 1959) and *Capablanca's Hundred Best Games of Chess*, by H. Golombek (Harcourt, Brace, N.Y., 1947).

period, Capablanca participated in 37 major tournaments scoring 366½ out of 481 points, a life average of .762. Tables 2 and 3 give the age distribution of their performances by percentage points scored and by tournament standing.

The data in Table 2 show a very marked trend in the case of Capablanca, that is, as he became older, his percentage score decreased perceptibly. Although there is a percentage improvement for Lasker between the two age groups 20-29 and 30-39, this difference may be more illusory than real. The number of games played by Lasker in the age group 30-39 is substantially less than the number played in the younger age group 20-29; consequently, the percentage improvement may reflect the smaller sample size in the later age period. It is also likely that each player has an individual rate of aging curve, with variations around different peak periods. The

last four decades of Lasker's chess career also indicate successive declines in scoring.

Although somewhat more difficult to interpret, the data on tournament standings given in Table 3 are also indicative of declines associated with increasing age. For the comparable periods of their careers, i.e., 20-59 years, Lasker appears to do better than Capablanca in both tournament standing and percentage scores; it is not until Lasker is in his 60's that he finishes below 3rd place and that his percentage score falls substantially.

Another aspect of the aging effect in tournament play may be detected in the movement of the ratio, games drawn to total games played. In effect, the advantage that white is conceded to have (by virtue of the first move) is not fully exploited by older players. It would seem that older players draw more frequently than younger

Table 3. Tournament Standings of Lasker and Capablanca, by Age

Age Group	Lasker Standing *				Capablanca Standing *			
	1st	2nd	3rd	Other	1st	2nd	3rd	Other
20-29	5	1	2	0	7	3	0	0
30-39	2	½	½	0	5	1	1	0
40-49	1½	½	0	0	7½	5	1	2½
50-59	3	1	0	0	2	½	½	1
60-69	0	0	1	3	—	—	—	—

* When a tie results in a chess tournament, two or more contestants share the ranking. A tie by two players for first place, e.g., means that each player will receive one-half of the first and one-half of the second prize money.

Sources: *Emanuel Lasker: The Life of a Chess Master*, by J. Hannak (Simon and Schuster, N.Y., 1959), and *Capablanca's Hundred Best Games of Chess*, by H. Golombek (Harcourt, Brace, N.Y., 1947).

Table 4. Proportion of Games Drawn By Lasker and Capablanca in Tournaments, by Age

Age Group	Lasker Games			Capablanca Games		
	Played	Drawn	%	Played	Drawn	%
20-29	102	23	.225	133	28	.211
30-39	58	12	.207	106	42	.396
40-49	36	10	.278	199	86	.432
50-59	59	22	.373	43	21	.488
60-69	66	36	.545	—	—	—
Total	321	103	.311	481	177	.368

Sources: *Emanuel Lasker: The Life of a Chess Master*, by J. Hannak (Simon and Schuster, N.Y., 1959), and *Capablanca's Hundred Best Games of Chess*, by H. Golombek (Harcourt, Brace, N.Y., 1947).

players. The data showing the trends in draws for Lasker and Capablanca are presented in Table 4.

Rank correlation coefficients between age and tournament standing were computed for a dozen international tournaments (held between 1894 and 1958). These coefficients range between .2 and .8 and were in all instances positive. Although not statistically significant, these results do not contradict the other findings presented in the foregoing discussion. The use of rank correlation is not appropriate to a detailed analysis; slight changes in age (a year or two) result in ranking differences, although such age differences do not affect performance.

The results I have obtained suggest some tentative answers to the questions posed at the outset. The statistical data that I have selected and analyzed indicate definite relationships between aging and chess performance. (5) More extensive research may serve to confirm (or deny)

the conjecture that increases beyond a certain average age (perhaps 40 years) decrease the quality of tournament chess play definitively.

NOTES

(1) Current chess rules for master tournaments require that each player make 40 moves in 2 hours or 50 moves in 2½ hours on his stop clock. Failure to satisfy this condition results in automatic forfeiture of the game at the time this breach, overstepping the time limit, has been committed.

(2) Briefly, the calculation is $t = \frac{44.7-32.8}{3.7} = 3.2+$ for 18 degrees of freedom

(3) Lasker was born in 1868 in Germany and died in New York City in 1941.

(4) Capablanca was born in 1888 in Cuba and died in New York City in 1942.

(5) Of interest regarding some of the causal aspects of aging is the discussion in Chapter 3, What is "Aging" and Chapter 4, The Abilities of The Old, in *Longer Life* by George Soule (Viking Press, N.Y., 1958).

GEOLOGICAL SAMPLING—CONTINUED FROM PAGE 12

bins gradually, the rate and degree of restriction, and the bins to be restricted, being determined in part by the success of the operator in hitting those bins. The originally-selected filter would affect the final result, but the development of the final distribution would also be affecting the filter. Mutual filtering is thought to be quite common in geomorphic sampling, with more than one filter operating in many instances.

Censoring imposes few difficulties in the way of the practical analyst. Truncation is a more severe restriction. Filtering and mutual filtering, especially with

multiple filters, may be even more severe. The case is not entirely hopeless, however, and in some instances a logical and geologically acceptable separation can be made, despite the very great difficulties. It is proposed to describe some of this work at a later date, in more specialized publications. Meanwhile, the present writer hopes that the notion of filtering may be of such interest and even importance, in fields other than geology, as to warrant discussion of this note.

REFERENCE

Mendenhall, William, 1958: "A bibliography on life testing and related topics," *Biometrika*, v. 45, parts 3 and 4, pp. 521-543.

ORGANIZATION OF STATISTICAL INSTRUCTION—CONTINUED FROM PAGE 16

11. Summary and Outlook

A suggestion is made for consideration of a common core of knowledge with which statisticians graduating with bachelor, master, and doctoral degrees might reasonably be expected to have. The organization of course programs whose content would include the common core of knowledge is discussed. An illustration of common core course programs for the three degrees which appear to work reasonably well at a particular land grant university is given. It is realized that such programs may differ in certain aspects for differing types of universities and would undoubtedly differ as to non-common core course requirements within and among differing types of universities.

One should not lose sight of the obvious fact that no college or university instructional program can be any better than the staff employed. Further that its teaching staff should also be actively engaged in research.

Another obvious observation is that the outlook for

the future development of new statistical theory and methodology will undoubtedly call for more extensive and intensive training in advanced mathematics and at the same time an active interest among staff and students in statistics in the processes by which sound conclusions are drawn from observations.

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CHAPTER NOTES

Arizona

An all-day meeting was held on October 22nd in conjunction with the Arizona Computer Club. At the morning session, the speakers were Max Dengler, Department of Mathematics, Arizona State University, who discussed, "Foundations of the Normal Law of Probability"; and David Marden, Budget Analyst, Arizona Public Service, whose subject was "Statistical Approach to Budgeting with Use of High Speed Digital Computers." The afternoon session featured a symposium on statistics and computers, with a panel composed of Tom Caldwell, Numerical Analysis Laboratory, University of Arizona; Fred Ennerson, Statistical Quality Control, Hughes Aircraft; Lester Fort, Jr., CEIR, Fort Huachuca; and Henry Tucker, Statistics, University of Arizona. These sessions were held on the University of Arizona campus in Tucson. The evening session, which was held at the Tidelands Motor Inn, included a social hour, dinner, and a talk by Dr. E. C. Smith of IBM. Dr. Smith's subject was, "Russian Translation Program."

Austin

A very active year was experienced by the Austin Chapter of the American Statistical Association between September 1959 and September 1960. A total of six luncheon meetings were held at the Villa Capri Restaurant, where outstanding speakers were featured from the business, government and academic world. Members representing the Texas Highway Department, Texas Research League, Department of Public Safety, United States Department of Agriculture, Southwestern Bell Telephone Company, the University of Texas, and the Texas Department of Health attended these meetings, which averaged 30 persons per meeting. The speakers for the past season were the following:

Hon. Vernon A. McGee, Staff Director of the Legislative Budget Board, "Financing Texas State Government Today . . . and Tomorrow"

Mr. Willis McVey, Managing Rate Actuary, Texas State Board of Insurance, "The New Safe-Driving Insurance Plan"

Dr. Francis B. May, Statistician, The Bureau of Business Research and Associate Professor of Business Statistics, The University of Texas, "Recent Developments in Quantitative Methods of Analysis"

Mr. Fred Rymer, Supervisor, Firearms Section, Texas Department of Public Safety, "The Practical Application of the Theory of Probability in Firearms Identification"

Inspector C. G. Connor, Inspection and Planning Division, Texas Department of Public Safety, "Mathematics of Playing God in Traffic Supervision"

Mr. Luke Robinson, Retirement Claims Officer, State Employee Retirement System, "Operation of the Retirement System"

In the meeting of September 20, 1960 the new officers were elected. They are:

President—A. D. MORGAN, Texas Highway Department

Vice-President—DONALD CARROLL, Director, Bureau of Vital Statistics, Texas Department of Health

Secretary-Treasurer—P. JOHN LYMBEROPOULOS, Instructor in Business Statistics, The University of Texas

Publicity Director—MRS. BETTY H. PHILLIPS, Senior Journalist, Travel Information Division, Texas Highway Department

Central Indiana

A joint meeting with the American Society for Quality Control was held at Butler University on October 11th. On November 3rd, a dinner meeting was held at the Indiana University Medical Center Union Building in Indianapolis, at which Professor David R. Derge of the Department of Government, Indiana University, spoke on, "The Use and Abuse of Polls in Elections and Policy Making." The tentative program for the remainder of the year 1960-61 is as follows:

December 1—at Indianapolis—Economic Forecast

January 12—at Indianapolis—Discussion on Taxes

February 2—at Indianapolis—Charles E. Redman, Biometrician with Lilly

March 3—at Indianapolis—Demography, Robert Calhoun

April 6—at Purdue—James Norton's Presidential Address and election of officers

May 3—at I.U.—Installation of officers and a visiting speaker

Central Iowa

At a joint meeting with the Statistical Laboratory Seminar at Iowa State University held on September 14th, Professor W. G. Cochran of Harvard University spoke on, "Sequential Experimentation." Emphasis was given to methods and concepts useful in the analysis of sensitivity data.

A meeting was held on October 26th at the Memorial Union on Iowa State University campus. The speaker was Dr. Gerhard Tintner, Professor of Economics, Statistics and Mathematics at Iowa State University, whose subject was "A Criticism of Modern Statistics."

Central New Jersey

Mr. Paul Perry, President of the Gallup Organization and Research Director, American Institute of Public Opinion, was the speaker at the October 11th meeting held at Princeton University. Mr. Perry spoke on the Gallup Poll election surveys, discussing procedures and problems in data-collection, analysis and interpretation.

At the November 3rd meeting, Mrs. Gladys W. Ellsworth, Chief of Research and Statistics, N.J. Department of Conservation and Economics Development,

spoke on "Some of the Economic Challenges of the 60's."

The following officers were elected at the October meeting:

President—WILLIAM R. ALLEN, Consultant, Princeton, New Jersey

Vice President—REUBEN COHEN, Chief Statistician, Opinion Research Corp., Princeton, New Jersey

Secretary-Treasurer—STANLEY J. KEMPNER, Vice President, Mathematica (subsidiary of Market Research Corp. of America), Princeton, New Jersey

Cincinnati

At the October 20th meeting, Dr. Satya Dubey of the Procter and Gamble Company spoke on "A Simple Test Function for Guarantee Time Associated with the Exponential Failure Law." The following officers were elected for the 1960-61 year:

President—JAMES J. TUMBUSCH, Procter & Gamble Company

Vice-President—RON WEIDNER, General Electric Company

Secretary—KENNETH A. BUSCH, Robert A. Taft Sanitary Engineering Center

Treasurer—ALFRED T. MAY, National Lead Company.

Chicago

Mr. Jack R. Cole, President of Mail Advertising Corporation of America and a member of the Census Bureau's Advisory Committee on Census Enumeration Areas, was the speaker at the September 27th luncheon meeting. Mr. Cole's subject was "Profitable Uses of Census Data."

A joint luncheon meeting with the Chicago Chapter of the American Marketing Association was held on October 11th. Dean W. Allen Wallis, Executive Vice-Chairman of the Cabinet Committee on Price Stabilization and Economic Growth, and Special Assistant to President Eisenhower, spoke on "Measurement and Evaluation of Economic Growth."

"The City Worker's Family Budget: Its Preparation and Meaning" was the subject at the luncheon meeting held on October 25th. Mr. Adolph Berger, Regional Director of the Bureau of Labor Statistics, U.S. Department of Labor, was the speaker.

The second dinner meeting of the 1960-61 year was held November 2nd. Mr. Elmo Roper of Elmo Roper Associates discussed "Surveying Public Attitudes Towards Candidates and Issues in an Election Year."

Detroit

George W. Mitchell, Vice-President in Charge of Research, Federal Reserve Bank of Chicago, was the speaker at the dinner meeting held on October 26th. Mr. Mitchell's subject was "Economic Trends in Business Conditions." John Sagan, Assistant Treasurer of the Ford Motor Company, was guest chairman.

Harrisburg

Harrisburg Chapter of the American Statistical Association officially became the 41st Chapter of the national organization on November 1st, when it received its charter from Donald C. Riley, ASA Executive Director, at a dinner meeting at Castiglia's Restaurant. Mr. Riley presented the charter to Dewey O. Boster, Chief Statistician in the Division of Crop Reporting, Department of Agriculture, who is President of the new Chapter. More than 140 persons are charter members of the Harrisburg unit.

Mr. Riley also talked on "The Past, Present and Future of the American Statistical Association." In a humorous vein, he told the local statisticians that he had met Russian statisticians at various international meetings, and said that it must be quite difficult for them to do their work. "They've got to keep two sets of figures on everything," Mr. Riley said, "those they publish and those they operate the country on."

On the serious side, he said that some of the fault for people not understanding statistics lies with the statistician himself. It is important, he said, that statisticians explain their findings in clear, non-technical language, and that they point out any shortcomings or limitations to their figures.

Mr. Riley cited the current investigation of the statistical reliability of the various TV rating systems as an example of the type of projects undertaken by the ASA.

New York

The Social Statistics Division sponsored a meeting on work injury statistics on October 19th. Julius Bisom, New York State Department of Labor, discussed "Work Injuries in New York State, 1959," and A. J. Jaffe and Lincoln H. Day, Bureau of Applied Social Research, Columbia University, spoke on "Some Probability Tables on Seriously Disabling Work Injuries." Dr. Robert C. Darling, College of Physicians and Surgeons, Columbia University, was the discussant. A pre-meeting dinner was held at Klubes Restaurant.

The topic of the October 26th meeting sponsored by the Biostatistics Division was "New Developments in Voluntary Health Insurance." The Speakers were Odin W. Anderson, Health Information Foundation, whose subject was "Where Do We Stand With Health Insurance Today?"; Donald B. Straus, Health Insurance Plan of Greater New York, who spoke on "An Experiment in Individual Enrollment"; and Arthur H. Harlow, Jr., Group Health Insurance, Inc., who discussed "The Psychiatric Research Project." Monroe Lerner, Health Information Foundation, was chairman.

The New York Chapter has formed a committee to promote greater interest among college students and faculty members in Chapter activities. The committee hopes to interest persons in each of the nearly 50 colleges and universities in the area. Professor John I. Griffin, Baruch

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Philadelphia

Chapter officers for the 1960-61 season are:

President—DR. STANLEY SCHOR, Statistics Department, University of Pennsylvania

Vice-President—DR. BERTRAM W. ZUM-ETA, Federal Reserve Bank

Secretary-Treasurer—FREDERICK N. SASS, Pennsylvania Railroad Company

Sacramento

The September 15, 1960 meeting was

devoted to a discussion of the highlights of the Annual Meeting of the American Statistical Association conducted at Stanford University on August 23-26. Edmond A. Radsliff discussed chapter and association activities; Kenneth L. Maxwell, employment and economics; Carl Frisen, population and census reports; and Stuart N. Adams, corrections and other social statistics.

Saint Louis

The topic at the October 20th luncheon meeting was "Statistics—Operations Research." Dr. Frederick Williams, Associate Professor of Statistics, University of Missouri, was the speaker.

San Francisco

The Chapter held its first fall luncheon meeting on October 12th. Mr. Marvin Field, founder and President of Field Research Company, spoke on "1960 Opinion Polls—Another 1948?"

Southern California

A dinner meeting was held on September 29th at the Huntington-Sheridan Hotel, Pasadena. The "Silver Knight" trophy for the best speaker of the year was awarded to Mr. Clay Braun, Account Executive with the American Research Bureau, Inc. As is the custom of the Chapter, the Speaker of the Year spoke again, his subject being, "Audience Measurement—Television's Yardstick." The new officers were installed at the meeting. They are:

President—WILLIAM V. HENDERSON, Pacific Telephone Company

Vice-President—JAMES D. WILKINSON, Ducommun Metals and Supply

Treasurer—RAYMOND J. JESSEN, General Analysis Corporation

Secretary—KENNETH G. SPIKER, City of Los Angeles—City Council

The meeting was followed by dancing and entertainment.

A joint dinner meeting with The Institute of Management Sciences was held on

October 27th. Two of Southern California's outstanding executives, Mr. K. F. Julin, President, and Mr. V. Kostuck, Vice President—Planning, the Leach Corporation, spoke on "The Science of Management Through the Use of Statistics."

Washington, D.C.

The October meeting was a quadrennial event held before each presidential election—Election Forecasting. This year's meeting was jointly sponsored by the D.C. Chapter, American Association of Public Opinion Research. It featured Richard M. Scammon, Director of Elections Research, Governmental Affairs Institute; George Belknap, Director of Voting Analysis, Democratic National Committee, and George Grassmuck, Director of Research, Nixon-Lodge Headquarters, Republican National Committee.

Over half the meeting time was devoted to question-and-answer. The speakers generally agreed that the large national polls are primarily for entertainment, like the World Series, but provide little guidance for campaign strategy. Of much greater campaign value are the numerous undisclosed and carefully-guarded state and local polls, taken in critical areas and designed to illuminate how best to distribute campaign money and time. Dr. Scammon believed that the variable effects of poll results on different population groups,

such as the voters, the campaign workers, and the opposition, make them generally ineffective as publicity tools for deliberately influencing the final results. Some of the audience strongly disagreed. The speakers also maintained that polls are only one of many factors to analyze in planning campaign strategy. Also they felt that careful analysis and projection of past behavior are as important and effective in election forecasting as polls. On this point the political party representatives were in sharp disagreement as to the weight to be given the last two presidential elections. A stimulating evening!

Chapter officers for the 1960-61 season are:

President—PAUL F. KRUEGER, Office of Statistical Standards, Bureau of the Budget

Vice-President—EDWIN D. GOLDFIELD, Bureau of the Census

Secretary-Treasurer—ALBERT MINDLIN, D.C. Government

District Representative—E. J. ENQUIST, Jr., Internal Revenue Service

Executive Committee—ETHEL D. HOOVER, Bureau of Labor Statistics; LUTHER W. STRINGHAM, Department of Health, Education & Welfare; SEYMOUR L. WOLFBEIN, Department of Labor; HAROLD WOOL, Department of Defense

Grant I. Butterbaugh, 1893-1960

Dr. Grant I. Butterbaugh, Professor of Statistics, University of Washington, and Editor in Chief of the *International Journal of Abstracts on Statistical Methods in Industry*, died on September 21, 1960, in Seattle, Washington at the age of 66. His death occurred from a heart attack while he was returning from an afternoon expedition with his wife gathering wild plants in the woods.

Born in Merrillan, Wisconsin, Professor Butterbaugh took his A.B. degree from the University of Wisconsin in 1916. He earned the M.B.A. degree from the University of Washington in 1923, and nineteen years later took his Ph.D. degree at the University of Chicago. Professor Butterbaugh was Assistant Professor in Accounting at Oregon State College from 1925 to 1926, and Professor and Comptroller from 1926 to 1928. He then returned as Assistant Comptroller of the University of Washington from 1928 to 1930, and became Professor of Statistics at the University of Washington in 1930, a post that he held until his death.

Professor Butterbaugh is renowned for his work in bibliography in the field of industrial and applied statistics; first, as author of a *Bibliography of Statistical Quality Control*, published by the University of Washington Press, Seattle, in 1946, in which 712 articles, manuals and books of the period from 1924 to 1945 were abstracted. A supplement, covering the period 1946 to 1949, appeared in 1951, these three and one-half years producing 725 items, a slightly larger number than the previous two decades. This interest in abstracting led Professor Butterbaugh to encourage the founding of the *International Journal of Abstracts on Statistical Methods in Industry*, which has been published by the International Statistical Institute at The Hague from 1954 to date. He served as General Editor since its beginning, a post to which he contributed enthusiasm and devotion. Professor Butterbaugh developed a corps of twelve regional editors and a score of cooperators to secure world-wide coverage for the International Journal. In this Journal, as of the latest issue, (Volume 7, No. 2) 2,195 abstracts have been published.

Dr. Butterbaugh became well known in international statistical circles through his editorship of the International Journal and through his faithful attendance, together with his wife, Laura, at the biennial meetings of the International Statistical Institute held in Tokyo, Brussels, Stockholm, Rio de Janeiro, Rome, New Delhi, Washington; as well as in other international capitals. These meetings served to bring the Regional Editors together.

Professor Butterbaugh was a Fellow of ASA and the American Society for Quality Control and a member of the American Association for the Advancement of Science. He had recently taken on the Chairmanship of the Committee on Audio-Visual Aids of the American Statistical Association. He was a member of Beta Gamma Sigma, business-administration honorary, and Beta Alpha Psi, accounting fraternity.

He was energetic and active in association work and will be long remembered as the one who, when others said it could not be done, showed the way to successful statistical, methodological abstracting.

William R. Fabst, Jr.
Washington, D.C.

NEWS ABOUT MEMBERS

J. S. Ahmann, formerly of Cornell University, has been appointed Chief of the Educational Research and Services Center of the Colorado State University Research Foundation at Colorado State University.

Herman G. Berkman, Associate Professor of Economics, University of Wisconsin, has been visiting several universities to study the type of research and training offered in urban studies, and recently spoke before the National Association of Housing and Redevelopment's Annual Meeting in Detroit on "Training the Urbanist." These were results of a research grant made by the Graduate School of the University of Wisconsin for studying the application of linear programming techniques in interareal research.

E. Douglass Burdick, Professor of Statistics at the University of Pennsylvania, spent the summer in Turkey for the International Cooperation Administration to stimulate research in problems of economic development among businessmen, universities and government. Because of his experience with the Planning Commission of India, he was also asked to make suggestions on the reorganization of the Central Statistical Office of the Government of Turkey.

Ralph E. Burgess has announced his resignation as Chief Economist for the American Cyanamid Company, a post he held for the last seven years, to return to management consulting in which he was engaged prior to joining Cyanamid. His firm, Ralph E. Burgess and Associates, of Wilton, Connecticut, is specializing in long-range planning for industry, non-profit institutions and municipalities.

Staunton K. Calvert, formerly with the Alcohol and Tobacco Tax Division, has been promoted to Analytical Statistics Officer in charge of wealth and individual income statistics in the Income, Finance and Wealth Branch of the Internal Revenue Service.

John deCani, Assistant Professor of Statistics at the University of Pennsylvania, returned from Bergen, Norway where for the past year he has been a Fulbright Lecturer at the Norwegian School of Economics.

Marie M. Delaney, formerly Acting Chief of the Statistical Branch, Division of Program Analysis at the Bureau of Old Age and Survivors Insurance, transferred to the Division of Statistics and Research of the Office of Education, Washington, D. C., as Chief, Statistical Operations Section, Educational Statistics Branch.

W. Edwards Deming was in Ankara for two weeks recently to assist the Central Statistical Office with a number of sampling problems in connection with the studies of housing conditions in twenty large cities in Turkey, and in connection with the forthcoming general censuses of population, agriculture and commerce. He will return for two weeks in February.

Satya D. Dubey received the Ph.D. degree in Statistics from Michigan State University in June 1960, and has joined the Mathematics and Statistics Department of The Procter & Gamble Company, Cincinnati, Ohio.

Charles W. Dunnett was awarded a D.Sc. degree in Statistics on completion of a two-year period of research at the University of Aberdeen, Scotland, under Dr. D. J. Finney, F. R. S. The title of his thesis was, "The Statistical Theory of Drug Screening." He has now returned to his position as head of the Statistical Design and Analysis Department at the Lederle Laboratories Division of the American Cyanamid Company, Pearl River, New York.

Mary W. Fox, recently with the National Institutes of Health, is now employed by the Cleveland Psychiatric Institute. In this position, she will be the statistical consultant on the research projects of the Institute.

Milton Gilbert has resigned from the post of Director of Economics and Statistics at the Organization for European Economic Co-operation, Paris, to become Economic Adviser of The Bank for International Settlements at Basle.

Morris Hamburg, Associate Professor of Statistics at the University of Pennsylvania, returned from a one year stay at Harvard as a fellow at the Institute of Mathematics for Applications to Business, and has resumed editorship of THE AMERICAN STATISTICIAN.

Myron S. Heidingsfield, former Manager of Market Research in the Consumer Products Division of the Radio Corporation of America, has been named Associate Dean of the School of Commerce and Finance at Villanova University.

Robert E. Herman, formerly with the Office of Chief Economist, U. S. Bureau of Mines, has transferred to the Bureau of Labor Statistics. He is now a Survey Statistician in the Quality Control and Industrial Classification Section, Program Planning and Techniques Branch, Division of Manpower and Employment Statistics.

Esther Hochstim has been appointed Project Director of a study on evaluation procedures for a Cardiac Work Evaluation Unit at the Alameda County (California) Heart Association, under a grant by the American Heart Association.

Patrick R. Huntley, formerly Assistant Professor of Economics and Assistant to the Dean of the College of Business and Public Administration at the University of Arkansas, has accepted a position as Statistician (Economics) in the Industry Division, Bureau of the Census.

Eugene Levine received the Ph.D. degree in Public Administration from American University in June 1960. His present position is Chief, Statistics and Analysis

Branch, Division of Nursing, U. S. Public Health Service.

Angus G. MacLean, formerly coordinator and manager of statistical services of the California Test Bureau, has been appointed Senior Applications Analyst for the Computer Division of Clary Corporation, San Gabriel, California. He will be specializing in the fields of higher mathematics, statistics and space technology in his new position.

Marion W. Mak, formerly of the Reports Division, has joined the staff of the Statistical Techniques Branch, Internal Revenue Service.

Hugh J. Miser, formerly with the Research Triangle Institute of Durham, North Carolina, has joined the staff of the Navy's Operations Evaluation Group as Director of its newly established Applied Science Division at the Massachusetts Institute of Technology in Cambridge, Massachusetts.

Joseph T. Neville, formerly of the Mathematical Statistics Staff, has been promoted to the position of Statistician with the Statistical Research Staff, Statistical Techniques Branch, Internal Revenue Service.

Maurice E. Odoroff, formerly Chief, Program Evaluation and Reports Branch, Division of Hospital and Medical Facilities, Public Health Service, was transferred to the National Institutes of Health where he is Assistant to the Chief, Division of General Medical Sciences.

Harold C. Passer has been appointed Company Economist for Eastman Kodak Company, Rochester, New York. He has been a Staff Economist at Eastman Kodak since 1952.

Samuel D. Rosenthal, formerly with the District of Columbia Government, has joined the Statistical Research Staff, Statistics Division, Internal Revenue Service.

Rose Sachs has transferred from the Statistics Branch of the Food and Drug Administration to the Biometry Section of the Division of Air Pollution, Public Health Service.

Gregor Sebba has resigned as Professor of Economics and Chairman of Business Statistics, College of Business Administration, University of Georgia, and is now Professor in the Graduate Institute of the Liberal Arts at Emory University.

David S. Stoller, Logistics Department, The RAND Corporation, received a part-time appointment to the faculty of the Graduate School of Business Administration, University of California, Los Angeles, as Lecturer (Associate Professor) for the academic year, 1960-61. He is the instructor in the "Seminar in Operations Analysis" for the fall semester.

Ledyard R. Tucker has been appointed Professor of Psychology, University of Illinois.

THE PRESIDENT'S COLUMN—CONTINUED FROM PAGE ONE

the program can be continued or not, it was the unanimous consensus that the travel grant program to date had served a very useful purpose and the Association's representatives have expressed their appreciation to the Carnegie Corporation.

In this brief progress report, I might also mention that we expect the report of our special Technical Committee on Broadcast Ratings for the Sub-committee on Legislative Oversight of the House Committee on Interstate and Foreign Commerce to be forthcoming in the near future. You will recall that this was a special request made by the House Committee to the American Statistical Association. We selected a good committee and its report is to be independent of any review.

This is my last communication to the membership as President of the Association. As Past-President in 1961, I will continue on the Board of Directors for another year and will be anxious to continue to serve in any way that I can. I would like to thank all of you who have been so generous with your time and energy on the Association's affairs. ASA's 121 years, it seems to me, are worn very lightly and our society is more vigorous than at any time in its history. We are at the center of a tremendous expansion in statistics, with the opportunity of combining some of our efforts and activities

with other societies concerned with statistical methods and applications.

It is becoming obvious that ASA does not currently have sufficient resources to carry out the kind of program that would be of most benefit to the statistical profession. To perform its role, in a period of rising costs, an increase in dues is becoming a necessity.

I think it is evident that the Association, in the National Office, has done its utmost to hold costs to the present low level. Expenses have been held as tight as possible while means were sought to increase income aside from dues and subscriptions. Considering how costs have risen since World War II, the Association has done well, I think, to provide publications and services at such low cost to each member. (For example, the most you have ever paid for registration at our Annual Meeting is \$3.00—and that was reached only this year.) A recent study shows that our dues are among the very lowest of any similar professional society.

In brief, if we expect our Association to be a leader in the statistical field, we must provide the wherewithal to do the job. I hope you will all bear this in mind in the coming years as we watch the unfolding of still greater advances in our profession and our science.

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